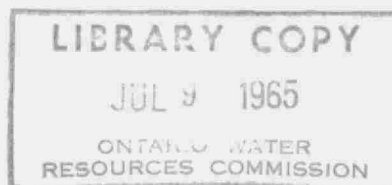


# VILLAGE OF TAVISTOCK

PROJECT NO. 61 - S - 85

ANNUAL REPORT

1964



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PROJECT NO. 61-S-85

ANNUAL REPORT

1964

Prepared by:

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Division of Plant Operations.

MAY, 1965

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## HISTORY

In March, 1960, the Village of Tavistock was first approached by the Ontario Water Resources Commission concerning the initiation of sewage treatment works.

The consulting engineer engaged to prepare plans and specifications for the project was R. M. Dawson, Stratford, Ontario.

In June, 1961, the Village signed an agreement with the Ontario Water Resources Commission to finance, construct and operate the project.

Construction of Contract A, which consisted mainly of laying sewers on Woodstock Street, was begun in May, 1961, by Armstrong Brothers Construction Company. Contract A required approximately six weeks to complete. Construction of the remainder of the project by Fullerton Construction Company commenced in July, 1962.

The project has been in operation since August, 1963.

The total cost to construct and design the sewage works was \$376,078.

### DESCRIPTION OF PROJECT

The Village of Tavistock is served by approximately 23,900 linear feet of sanitary sewers, varying in size between 8 inches and 15 inches, together with service connections and appurtenances.

The sewage collected by this system flows by gravity to the wet wells of two Robert Morse prefabricated underground pumping stations. Sewage is discharged to a 30-acre, two-cell waste stabilization pond via approximately 2,000 feet of 10-inch diameter asbestos cement forcemain from the pumping station located on William Street and via approximately 3,430 feet of 8-inch diameter cast iron and asbestos cement forcemain from the pumping station located on Hope Street.

Both pumping stations are equipped with two centrifugal pumps with an automatic control system, electrical switch gear, heater, dehumidifier, exhaust blower and sump pump. All of this equipment operates automatically and apart from maintenance and repair requires only periodic inspection to assure successful operation.

In the event of an emergency, the wet wells of both pumping stations have been provided with overflows and the pumping stations have been provided with alarm systems. The William Street pumping station overflow leads to a tributary of the Thames River and the overflow from the Hope Street pumping station leads to a nearby storm sewer.

Oxygen in the pond is supplied through photosynthesis of a family of simple plants collectively termed algae and by absorption from the atmosphere. Aerobic (oxygen using) bacteria in the pond break down and stabilize the organic matter.

When the pond surface is covered with ice and snow, free oxygen is not available. Anaerobic (non-oxygen using) bacteria and sewage fungi thrive under these conditions and the sewage becomes what is characteristically referred to as septic. During the spring ice break-up period when conditions are changing from anaerobic to aerobic, septic conditions prevail.

With aerobic treatment, the pond effluent should have a greenish colour indicating the presence of algae.

Effluent from both ponds flows to an outfall chamber where the pond depths are controlled by stop log weirs. From the outfall chamber, effluent is conducted via 150 feet of 21-inch diameter concrete storm drain pipe to the 24-inch diameter concrete outfall pipe leading 1,732 feet to a tributary of the Thames River.

Design data and a diagram of the waste stabilization pond system are appended in Appendices F and G respectively.

#### OPERATING PROCEDURES

The Division of Plant Operations is responsible for the operation of the entire water pollution control system, which includes sewers, pumping stations and waste stabiliza-

tion pond. In view of the size of the project, an arrangement was agreed upon whereby the Village of Tavistock performs the daily operating duties. The Operations Engineer supervises the overall operation of the project and the operator reports directly to him. During 1964, Mr. C. Wilker carried out the operational duties at the pumping stations and waste stabilization pond.

#### WASTE STABILIZATION POND OPERATION

The 1964 waste stabilization pond operating results are appended in Appendices A and B.

Throughout the year, a total of 21.920 million gallons of sewage were treated in the two ponds. Totals of 10.233 million gallons and 11.687 million gallons were pumped from the William Street and Hope Street pumping stations respectively. The average daily flow to the ponds throughout the year was 60,055 gallons.

The ponds were operated in storage until November 23, when draining of both ponds commenced. Just prior to draining, both ponds were at a depth of 3.5 feet. Draining ceased on December 1, 1964, when the ponds reached a depth of one foot. The ponds were operated in storage for the remainder of the year.

The average raw sewage BOD from the "grab" samples obtained at the Hope Street and William Street pumping stations were 530 ppm and 102 ppm respectively.

A local farmer complained that the quality of milk from



his cows was impaired as a result of drinking water from the Thames River tributary receiving pond effluent. As a result, it was agreed to operate the ponds in storage for the period May 24 to October 15.

#### ANNUAL OPERATING COSTS

The 1964 operating costs and the total 1964 costs to finance and operate the water pollution control system are appended in Appendices C and D respectively. In addition, the operating and total costs are represented diagrammatically on a percentage basis in Appendix E.

The total cost of sewage treatment to the municipality during 1964 was \$20,195.48. This expenditure includes operating, debt retirement, reserve for contingency and interest costs. Based on the 1964 assessed population of 1,206, the total annual per capita cost was \$16.75.

The 1964 operating cost was \$1,529.11. This figure includes expenditures for casual payroll, power and miscellaneous items as taxes, etc. Operating expenses are assumed directly by the Village with the exception of insurance which is paid by the Ontario Water Resources Commission and charged to the Village.

#### 1964 OPERATING REVIEW

During the spring of 1964, approximately one dozen sheep were allowed to graze on the waste stabilization pond dikes to keep the grass cut. However, on July 8, the farmer removed his sheep from the pond grounds because seven were killed by stray dogs. Grass on the pond dikes

was cut during the remainder of the year by Mr. René who was contracted by the Village to cut grass in the park.

The maintenance or guarantee period expired on August 23, 1964. A large portion of the deficiencies had been remedied by the end of the year.

With the exception of the matters previously mentioned, the operation of the project proceeded without incident.

A P P E N D I C E S

APPENDIX A  
1964 OPERATING RESULTS

MONTH	WILLIAM ST. STATION			HIDE ST. STATION			TOTAL MONTHLY FLOW (MG)	AVERAGE DAILY FLOW (IGPD)
	BOD (PPM)	S.S. (PPM)	FLOW (MG)	BOD (PPM)	S.S. (PPM)	FLOW (MG)		
JAN.	78	50	1.091	1500	3196	0.942	2.033	65,500
FEB.	41	66	0.610	820	354	0.713	1.323	45,500
MAR.			1.080			1.297	2.377	76,200
APR.	12	44	0.989	120	140	1.172	2.161	72,700
MAY	140	138	0.797	350	230	1.192	1.989	64,300
JUNE	36	35	0.615	150	105	0.737	1.352	45,000
JULY			0.700	360	222	0.764	1.464	47,100
AUG.	195	168	1.006	420	464	1.220	2.226	72,900
SEPT.	180	248	0.757	500	390	0.877	1.634	54,500
OCT.			0.658			0.754	1.412	45,600
NOV.			0.745			0.789	1.534	51,000
DEC.*	142	132	1.185	550	218	1.230	2.415	80,300
TOTAL			10.233			11.687	21.920	
AVG.	103	110	0.853	530	591	0.947	1.827	

NOTE:

\* Date sample obtained unknown.

BOD - Biochemical Oxygen Demand

S.S.- Suspended solids

PPM - Parts Per Million

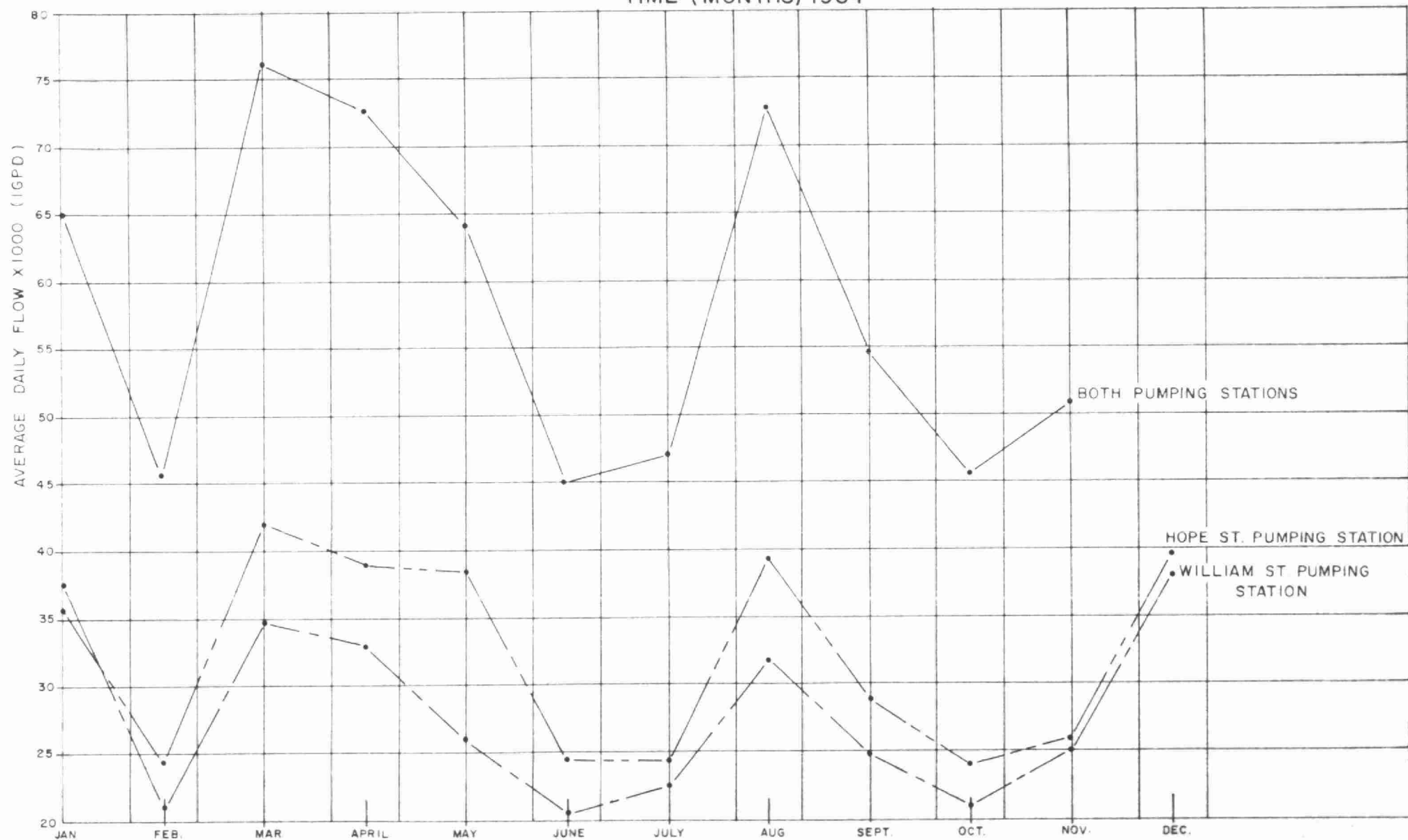
(MG)- Million Imperial gallons

IGPD- Imperial gallons per day

Results obtained from grab samples.

The sewage flow was computed from the pump running time multiplied by the pump capacity. The average daily flow was 60,055 gallons.

APPENDIX B  
TAVISTOCK  
AVERAGE DAILY FLOW (IGPD.)  
VS.  
TIME (MONTHS) 1964



APPENDIX C

1964 OPERATING COSTS

Casual Payroll	\$ 893.50
Power	447.73
Sundry, Equipment, etc.	<u>187.88</u>
TOTAL	\$ 1,529.11

---

YEAR	MG TREATED	COST PER MILLION GALLONS	COST PER CAPITA PER YEAR	COST PER TON OF BOD REMOVED
1964	21.920	\$ 69.76	\$ 1.27	\$ 42.24

---

\* Based on 1964 assessed population of 1206.

APPENDIX D

TOTAL 1964 COSTS

The total cost to the municipality during 1964 was as follows:

Operating Cost	\$ 1,529.11
Debt Retirement	3,448.00
Reserve for Contingency	2,686.00
Interest	<u>12,532.37</u>
TOTAL	\$ 20,195.48

NOTE: The amount in the Reserve for Contingencies as of December 31, 1964, was \$4,293.57.

On the basis of the 1964 assessed population of 1,206 the total annual cost of the Tavistock Water Pollution Control System was \$16.75 per person.

APPENDIX F

DESIGN DATA

WILLIAM STREET PUMPING STATION

(a) Type -	Robert Morse prefabricated underground station.
(b) Number of Pumps	2
(c) Pump Type	Weinman Centrifugal pumps
(d) Pump Capacities	No. 1 - 420 IGPM No. 2 - 410 IGPM Both - 580 IGPM
(e) Motor	10 HP
(f) Pump RPM	1730

HOPE STREET PUMPING STATION

(a) Type	Robert Morse prefabricated underground station
(b) Number of pumps	2
(c) Pump type	Weinman pumps
(d) Pump capacities	No. 1 - 360 IGPM No. 2 - 420 IGPM Both - 540 IGPM
(e) Motors	10 H.P.
(f) Pump RPM	1730

WASTE STABILIZATION POND

(a) Number of cells	2
(b) Area per cell	15 acres
(c) Area Criterion	One acre per 100 persons



(d) Design Population

Village	1,500
J. G. Field Company (Knitting Mill)	<u>1,500</u>
Total	3,000

(e) Design BOD loading - 17 pounds per acre per day.

(f) Effluent discharged to Thames River tributary via 150 feet of 21 inch diameter concrete storm drain pipe and 1732 feet of 24 inch concrete outfall pipe.

SEWERS

(a) Sanitary

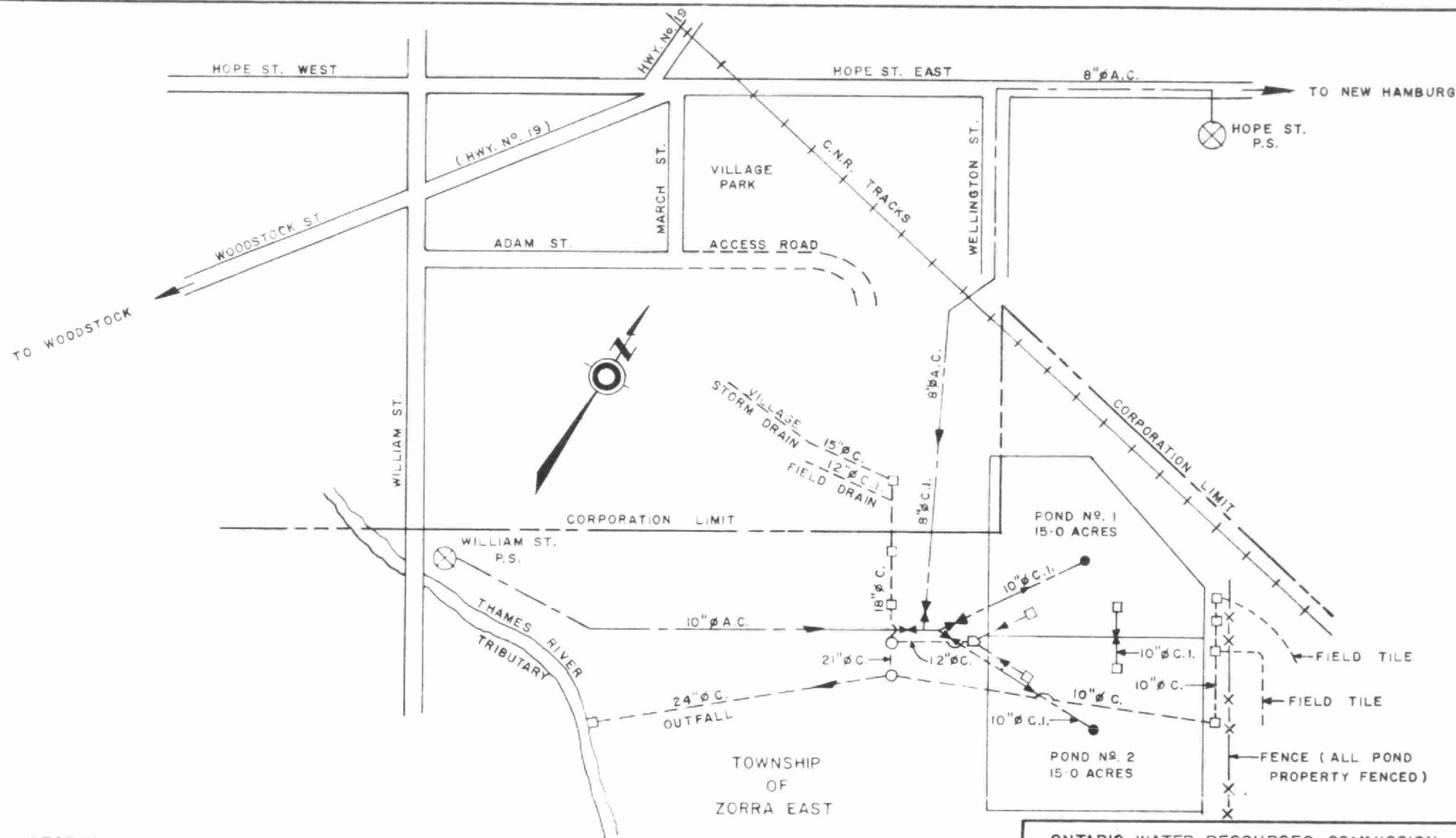
Diameter variance	8 to 15 inches
Linear feet	23,900

(b) William Street Forcemain

Diameter	10 inch
Linear feet	2,000
Material	Abestos Cement

(c) Hope Street Forcemain

Diameter	8 inch
Linear feet	3,430
Material	Abestos Cement and cast iron



# LEGEND

- FORCEMAIN
- - - - - OUTFALL and STORM DRAIN
- - - - - CORPORATION LIMIT
- ⊗ PUMPING STATION
- ⋈ VALVE
- CATCH BASIN
- ◇ OUTFALL CHAMBER
- MANHOLE

- C.T. CLAY TILE
- A.C. ASBESTOS CEMENT
- C.I. CAST IRON
- C. CONCRETE

## APPENDIX G

ONTARIO WATER RESOURCES COMMISSION

### VILLAGE OF TAVISTOCK WASTE STABILIZATION POND SYSTEM

SCALE: NOT TO SCALE

DRAWN BY: W.E.

DATE: JUNE 1965

CHECKED BY:

DRAWING N<sup>o</sup>.

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